

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

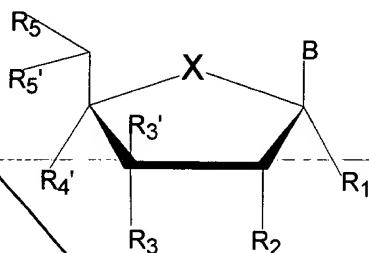
Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Please enter the following as a Preliminary Amendment to the Continuation Application filed concurrently herewith:

IN THE CLAIMS

55. A compound having the structure:



wherein:

- A1
sub C1
- B is a nucleoside base;
 - any alkyl portion of R_{1'}, R_{3'}, R_{4'} and R_{5'} is C1 to C10, linear, branched, saturated or unsaturated;
 - any aryl portion of R_{1'}, R_{3'}, R_{4'} and R_{5'} is a phenyl, polycyclic ring or heterocycle;
 - R₂ is selected from the group consisting of H, OH, alkoxy, aralkoxy and aryloxy; and
 - and X is O;

(I) where R₃ and R₅ are independently selected from the group consisting of OH, OCEPA and a hydroxyl blocking group:

(A) where:

R_1 is selected from the group consisting of N_3 , NO_2 , CF_3 , alkyl, substituted alkyl, aralkyl, substituted aralkyl, aryl, and substituted aryl, where the substituted portion of at least one of the substituted alkyl, substituted aralkyl and substituted aryl is selected from the group consisting of NO_2 , N_3 , CF_3 , SH , SR , $COOH$, $COOR$, SO_3H , SO_3R , F , Cl , Br , and I , where R is selected from lower alkyl, aralkyl and aryl; and

R_3' , R_4' and R_5' are all H ;

(B) where:

R_3' is selected from the group consisting of CN , N_3 , NO_2 , CF_3 , substituted alkyl, aralkyl, substituted aralkyl, aryl, and substituted aryl, where the substituted portion of at least one of the substituted alkyl, substituted aralkyl and substituted aryl is selected from the group consisting of CN , N_3 , CF_3 , NH_2 , NR_2 , OR , SH , SR , $COOH$, $COOR$, SO_3R , F , Cl , Br , and I , where R is selected from lower alkyl, aralkyl and aryl; and

R_1' , R_4' and R_5' are H ;

(II) where:

one of R_3 and R_5 is an internucleotide linkage and the other is selected from the group of OH , an internucleotide linkage and a hydroxyl blocking group;

R_1' is H ; and

two of R_3' , R_4' and R_5' are H and the other is modified as set forth below:

(A) R_4' is selected from the group consisting of substituted alkyl, substituted aralkyl, aryl, and substituted aryl, a highly electronegative radical, CF_3 and NO_2 , where R_4' does not comprise a label; and the substituted portion of the substituted alkyl and substituted aralkyl is other than OH , CHO , SH , NH_2 , $COOH$ and $NHC(O)CF_3$;

A'
COO-
SUB
C

(B) when R_5 is an internucleotide linkage;
 R_5' is selected from the group consisting of substituted alkyl, aralkyl, substituted aralkyl, aryl, and substituted aryl; and
the substituted portion of the substituted alkyl is other than NH_2 and epoxyethyl;
and

(C) R_3' is selected from the group consisting of substituted alkyl, aralkyl, substituted aralkyl, aryl, and substituted aryl; and
the substituted portion of the substituted alkyl is other than OH;

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2. The compound of claim 1 which satisfies grouping I(A).

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3. An oligonucleotide containing the nucleoside of claim 2.

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4. The compound of claim 1 which satisfies grouping I(B).

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5. An oligonucleotide containing the nucleoside of claim 4.

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6. The compound of claim 1 which satisfies grouping II(A).

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7. An oligonucleotide containing the nucleoside of claim 6.

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8. The compound of claim 6, wherein the substituted portion of at least one of the substituted alkyl, substituted aralkyl and substituted aryl is selected from the group consisting of NH_2 , NHR' , $NR'R''$ and $^+NR'R''R'''$ where R' , R'' and R''' are independently selected from the group consisting of lower alkyl and lower alkylcarbonyl.

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9. The compound of claim 6, wherein the substituted portion of at least one of the substituted alkyl, substituted aralkyl and substituted aryl is selected from the group consisting of CN, NO_2 , N_3 , halogen, OR' , SH and SR' where R' is selected from the group consisting of lower alkyl and lower alkylcarbonyl.

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10. The compound of claim ⁶⁰6, wherein the substituted portion of at least one of the substituted alkyl, substituted aralkyl and substituted aryl is selected from the group consisting of COOH, COOR' and CONR'R" where R' and R" are independently selected from the group consisting of lower alkyl, aralkyl and aryl.

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11. The compound of claim ⁶⁰6, wherein the substituted alkyl, substituted aralkyl and substituted aryl independently comprise a linker which is attached to at least one of a functional moiety, an artificial nuclease, a cross-linking reagent, an intercalator, and a reporter molecule.

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12. The compound of claim ⁶⁵11 which satisfies grouping II(B).

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13. The oligonucleotide of claim ⁶⁶12, wherein the substituted portion of at least one of the substituted alkyl, substituted aralkyl and substituted aryl is selected from the group consisting of NHR', NR'R" and ⁺NR'R"R'" where R', R" and R'" are independently selected from the group consisting of lower alkyl and lower alkylcarbonyl.

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14. The oligonucleotide of claim ⁶⁶12, wherein the substituted portion of at least one of the substituted alkyl, substituted aralkyl and substituted aryl is selected from the group consisting of CN, NO₂, N₃, halogen and SR' where R' is selected from the group consisting of lower alkyl and lower alkylcarbonyl.

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15. The oligonucleotide of claim ⁶⁶12, wherein R₄' is selected from the group consisting of a highly electronegative radical, CF₃ and NO₂.

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16. The compound of claim 1 which satisfies grouping II(C).

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17. The oligonucleotide of claim ⁶⁶16, wherein the substituted portion of at least one of the substituted alkyl, substituted aralkyl and substituted aryl is selected from the group consisting of NHR', NR'R" and ⁺NR'R"R'" where R', R" and R'" are independently selected from the group consisting of lower alkyl and lower alkylcarbonyl.

AT
COND.
SUB
C1

AT
COOH
SUB
C1
72 18. The oligonucleotide of claim ⁶⁶16, wherein the substituted portion of at least one of the substituted alkyl, substituted aralkyl and substituted aryl is selected from the group consisting of CN, NO₂, N₃, halogen, OH, OR', SH and SR', where R' is selected from the group consisting of lower alkyl and lower alkylcarbonyl.

73 19. The oligonucleotide of claim ⁶⁶16, wherein the substituted portion of at least one of the substituted alkyl, substituted aralkyl and substituted aryl is selected from the group consisting of COOH, COOR' and CONR'R", where R' and R" are independently selected from the group consisting of lower alkyl, aralkyl and aryl.

74 20. The oligonucleotide of claim ⁶⁶16, wherein the substituted alkyl, substituted aralkyl and substituted aryl independently comprise a linker which is attached to a least one of a functional moiety, an artificial nuclease, a cross-linking reagent, an intercalator, and a reporter molecule.

REMARKS

The requested changes do not add any new matter to the application.

Respectfully submitted,
Fish & Associates, LLP

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By Sandra Poteat Thompson

Sandra Poteat Thompson
Reg. No. 46,264

Attorneys for Applicant(s)
1440 N. Harbor Blvd, Suite 706
Fullerton, CA 92385
Tel.: (714) 449-2337
Fax: (714) 449-2339